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TRANSPORTATION ENGINEERING / PLANNING

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CITY OF YAKIMA
PLANNING DIV.

February 8, 2016

Project #: 19056

Kerry Martin
SOZO Sports of Central Washington
1200 Chesterley Drive, Suite 140
Yakima, WA 98902

RE: Transportation Impact Analysis for Yakima Sports Complex – Supplemental Analysis

Dear Kerry,

This letter summarizes new transportation analyses for the Yakima Sports Complex and is intended to supplement our original October 13, 2015 *Transportation Impact Analysis for the Yakima Sports Complex*.

Background

The October 13, 2015 Transportation Impact Analysis (TIA) was completed assuming full buildout of the 58-acre sports complex (accommodating 13 outdoor soccer fields and an 80,000 square foot indoor facility with the ability to house up to six multi-use athletic courts/fields). The analysis concluded that full buildout of the project would require the following off-site improvements:

- Signalization of the S. 38th Avenue/Ahtanum Road intersection, including the widening of Ahtanum Road for an eastbound left-turn lane and an exclusive westbound right-turn lane. Based on an iterations analysis, it was concluded that signalization and associated widening of Ahtanum Road would be needed at the equivalent of 12 or more soccer fields.
- Construction of a second exclusive lane (for right-turning vehicles) on the S. 48th Avenue (from Spring Creek Road to W. Washington Avenue) approach to the W. Washington Avenue/S. 48th Avenue intersection. It was further concluded that the second lane should be constructed as part of the initial development of the soccer complex in order to better accommodate the existing and projected right-turn movement and minimize delays to the predominate right-turn maneuver.

Following the completion of the transportation impact analysis, new development details have raised additional circulation questions as it pertains to the overall phasing of the soccer complex and how it will be impacted by the City of Yakima's plans to reconstruct/widen Spring Creek Road and S. 36th Avenue. To address these questions, the following three phasing scenarios have been analyzed:

1. Phase 1 – Partial 8-field build-out of the sports complex prior to reconstruction of Spring Creek Road and S. 36th Avenue.
2. Phase 2 – Partial 8-field build-out of the sports complex during reconstruction of Spring Creek Road and S. 36th Avenue.
3. Phase 3 – Full build-out of the entire sports complex after reconstruction of Spring Creek Road and S. 36th Avenue.

PHASE 1 – PARTIAL 8-FIELD BUILDOUT PRIOR TO SPRING CREEK ROAD/S. 36TH AVENUE RECONSTRUCTION

In order to better accommodate circulation to/from the soccer complex, the City of Yakima is considering the reconstruction and widening of Spring Creek Road and S. 36th Avenue between W. Washington Avenue and Sorenson Road. In recognition that this reconstruction/widening project likely won't be completed until sometime in 2017, an interim Phase 1 analysis was completed to identify the near-term transportation impacts of a partial buildout¹ of the soccer complex. This analysis was prepared under the following assumptions:

- Spring Creek Road and S. 36th Avenue are not improved beyond existing conditions.
- Eight soccer fields are constructed and in use as early as Spring 2016.
- SOZO Sports will construct an extension of Sorenson Road west of the S. 38th Avenue/Sorenson Road intersection along their southerly site frontage. As part of this extension, the S. 38th Avenue/Sorenson Road intersection will be reconfigured to a more traditional three-legged intersection.
- In the near-term, vehicular access to the 8-field soccer complex will be via a temporary driveway located off of the westerly extension of Sorenson Road approximately 250 feet west of the S. 38th Avenue/Sorenson Road intersection. Figure 1 illustrates the Phase 1 site plan.
- All other study area intersections and roadways will remain unchanged.
- 8 soccer fields will generate approximately 142 weekday PM peak hour trips and 243 Saturday midday peak hour trips as documented in Table 1. These trip generation estimates have been developed consistent with the methodology outlined in the October 2015 TIA.

¹ Based on conversations with SOZO Sports, they would ideally like to have a total of eight soccer fields ready for use/play in 2016.



Figure 1 – Phase 1 Site Plan (Prepared by Digital Design & Development)



Table 1 - Proposed Yakima Sports Complex Trip Generation (Partial Build-out)

Land Use	ITE Code	Size	Weekday Daily Trips	Weekday PM Peak Hour			Saturday Peak Hour of Generator		
				Total	In	Out	Total	In	Out
Soccer Complex	488	8 Fields	571	142	95	47	243	117	126

Under these development assumptions, the following questions have been addressed:

1. What are the operational impacts of 8 soccer fields at the S 38th Avenue/Ahtanum Road intersection?
2. What are the operation impacts of 8 soccer fields at the W. Washington Avenue/S. 48th Avenue intersection?
3. What are the operational impacts of 8 soccer fields to each of the local streets along Spring Creek Road?
4. What are the operational impacts of 8 soccer fields at the reconstructed S. 38th Avenue/Sorenson Road intersection, and what form of traffic control mitigation is necessary to accommodate buildout of Phase 1?

1. S. 38th Avenue/Ahtanum Road Intersection Operations

The October 13, 2015 TIA identified the need for mitigation at the S. 38th Avenue/Ahtanum Road intersection as it related to full buildout of the soccer complex. Utilizing the same distribution assumptions identified in the October 13, 2015 TIA, a supplemental analysis of this intersection under the partial 8 field build-out determined the following:

- The critical southbound approach (S. 38th Avenue) is forecast to operate at an acceptable level of service (LOS) C during both the weekday PM and Saturday midday peak hours.
- The intersection is not forecast to meet traffic signal warrants in accordance with the procedures outlined in the 2009 Manual on Uniform Traffic Control Devices (MUTCD).

Appendix A contains the Phase 1 operations worksheets for the S. 38th Avenue/Ahtanum Road intersection.

2. S. 48th Avenue/W. Washington Avenue Intersection

A supplemental operations and queuing analysis was performed at the S. 48th Avenue/W. Washington Avenue intersection under the partial 8-field build-out and determined the following:

- The critical northbound approach (S. 48th Avenue) is expected to operate at an acceptable level of service (LOS) B during both the weekday PM and Saturday midday peak hours.

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- A 95th percentile queuing analysis on the northbound S. 48th Avenue approach to W. Washington Avenue determined the queues for 8 fields can be managed under the existing single-lane approach. However, as described in the October 2015 TIA, the additional traffic from the soccer complex will add new right-turn demand from S. 48th Avenue onto W. Washington Avenue. Without a separate right-turn lane, there will likely be instances of long vehicle queues when traffic volumes spike at the end of games/practices/events. **Therefore, it is recommended that the right-turn lane be constructed as soon as possible, but no later than the corresponding reconstruction of Spring Creek Road/S. 36th Avenue.**

Appendix A contains the Phase 1 operations worksheets for the S. 48th Avenue/W. Washington Avenue intersection.

3. Spring Creek Road Delay Analysis

In order to address traffic concerns raised by the adjacent residential neighborhoods to the north of the soccer complex, a delay analysis was performed at each of the local streets (S. 40th Avenue, S. 41st Avenue, S. 44th Avenue, S. 45th Avenue, and S. 47th Avenue) that access Spring Creek Road between S. 48th Avenue and S. 36th Avenue under the partial 8-field build-out. To perform this analysis, traffic volumes on Spring Creek Road at each of these five intersections were estimated based on traffic volumes collected at the 48th Avenue/W. Washington Avenue intersection. Additionally, turning movement volumes to/from each side street were estimated based on trip generation estimates (number of residential units served by each local street) obtained from ITE's *Trip Generation*. Table 2 summarizes the resulting delay analysis at these intersections.

Table 2 - Spring Creek Road Delay Analysis – Partial 8-Field Build-out

		Spring Creek / 40th		Spring Creek / 41st		Spring Creek / 44th		Spring Creek / 45th		Spring Creek / 47th	
Number of Houses Served		6		16		25		4		23	
Time Period		PM	SAT	PM	SAT	PM	SAT	PM	SAT	PM	SAT
Trip Generation	In	4	3	10	8	16	13	3	2	14	12
	Out	2	3	6	7	9	11	1	2	9	10
Northbound LOS (8 fields)		A	A	A	A	A	A	A	A	A	A

As shown in the table, the critical northbound approach at each of the five local streets are forecast to operate with minimal delay (LOS A) during both the weekday PM and Saturday midday peak hours with 8 soccer fields in operation. Appendix A contains the Phase 1 operations worksheets for the Spring Creek Road intersections.

4. S. 38th Avenue/Sorenson Road

S. 38th Avenue and Sorenson Road currently link together through a horizontal curve at a location where there are no turn movements. **Upon development of the soccer complex, the horizontal curve will be reconstructed to form a three-legged intersection (new west leg providing temporary access to**



the soccer complex). With the exception of late afternoons and evenings at the start and end of sporting events, future traffic volumes through the intersection to/from the partial 8-field build-out will be minimal. Based on the anticipated traffic pattern, implementation of yield control is recommended on the northbound approach to the reconstructed S. 38th Avenue/Sorenson Road intersection.

Provision of yield control on the northbound approach will allow off-peak/non-event traffic to traverse the predominate north-to-east maneuver with minimal delay. Further, implementation of northbound approach yield control will provide adequate intersection capacity when east-west volumes through the intersection increase during periods of peak traffic to and from the soccer complex. By way of comparison, all-way stop control implementation is not recommended because all-way stop control warrants will not be met and drivers might begin to disregard stop signs in a setting where they observe no other traffic during off-peak periods. Appendix A contains the Phase 1 operations worksheets for the S. 38th Avenue/Sorenson Road intersection.

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SCENARIO 2 – PARTIAL 8-FIELD BUILDOUT DURING SPRING CREEK ROAD/S. 36TH AVENUE RECONSTRUCTION

As previously mentioned the City of Yakima is considering the reconstruction and widening of Spring Creek Road and S. 36th Avenue between W. Washington Avenue and Sorenson Road. Although the design details are still being analyzed, it is anticipated that this reconstruction/widening will include a three-lane cross section with sidewalks and bike lanes. For the purposes of this analysis, completion is preliminarily assumed for 2017. During the reconstruction process, it is anticipated that both Spring Creek Road and S. 36th Avenue will need to be closed off to all non-local through traffic, including the traffic generated by the soccer complex. With this assumed restriction in place, a supplemental Phase 2 analysis was completed to identify the near-term transportation impacts of the partial 8-field soccer complex remaining open. This analysis was completed under the following assumptions:

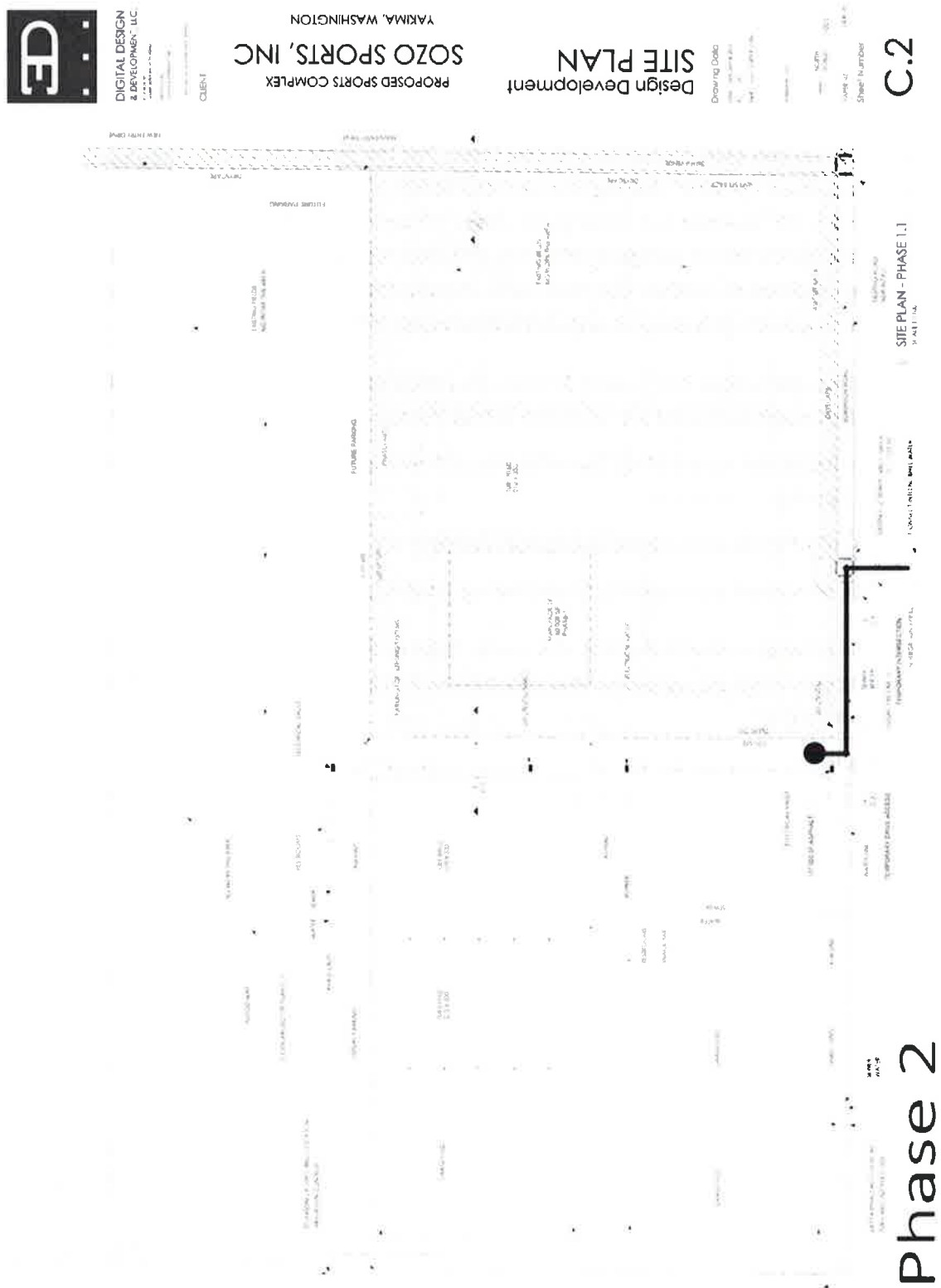
- Spring Creek Road and S. 36th Avenue are closed off and all site-generated trips to/from the 8-field soccer complex are forced to access the site via Ahtanum Road and S. 38th Avenue.
- Vehicular site access off of the extension of Sorenson Road will remain unchanged as shown in Figure 2.
- All other study area intersections and roadways will remain unchanged.

Under these development assumptions, the following questions have been addressed:

1. What are the operational impacts of 8 soccer fields at the S. 38th Avenue/Ahtanum Road intersection under the condition that this intersection is accommodating all of the soccer complex traffic?
2. What are the operational impacts of 8 soccer fields at the reconstructed S. 38th Avenue/Sorenson Road intersection?

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Figure 2 – Phase 2 Site Plan (Prepared by Digital Design & Development)



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1. S. 38th Avenue/Ahtanum Road Intersection

Utilizing the same trip generation assumptions identified in Phase 1 and assuming that Spring Creek Road and S. 36th Avenue are under reconstruction and closed to all through traffic, a supplemental analysis of this intersection under the partial 8 field soccer complex determined the following:

- The critical southbound approach (S. 38th Avenue) is expected to operate at LOS F during the weekday PM peak hour.
- The intersection is forecast to meet traffic signal warrants.
 - * With signalization, the intersection is forecast to return to acceptable levels of service. This assumes construction of an eastbound left-turn lane and protected left-turn phasing. Although not necessary to address level of service or capacity constraints, a westbound right-turn lane on Ahtanum Road would provide additional operations and safety benefits.

Appendix B contains the Phase 2 operations worksheets for the S. 38th Avenue/Ahtanum Road intersection.

2. S. 38th Avenue/Sorenson Road

As previously noted, Sorenson Road will be extended west of the S. 38th Avenue/Sorenson Road intersection. In addition, the existing S. 38th Avenue/Sorenson Road intersection will be reconfigured to a more traditional three-legged intersection. With these changes, the critical approach (northbound S. 38th Avenue) is expected to operate at an acceptable LOS B or better during both the weekday PM and Saturday midday peak hours. Appendix B contains the Phase 2 operations worksheets for the S. 38th Avenue/Sorenson Road intersection.

SCENARIO 3 – FULL BUILD-OUT AFTER SPRING CREEK ROAD RECONSTRUCTION

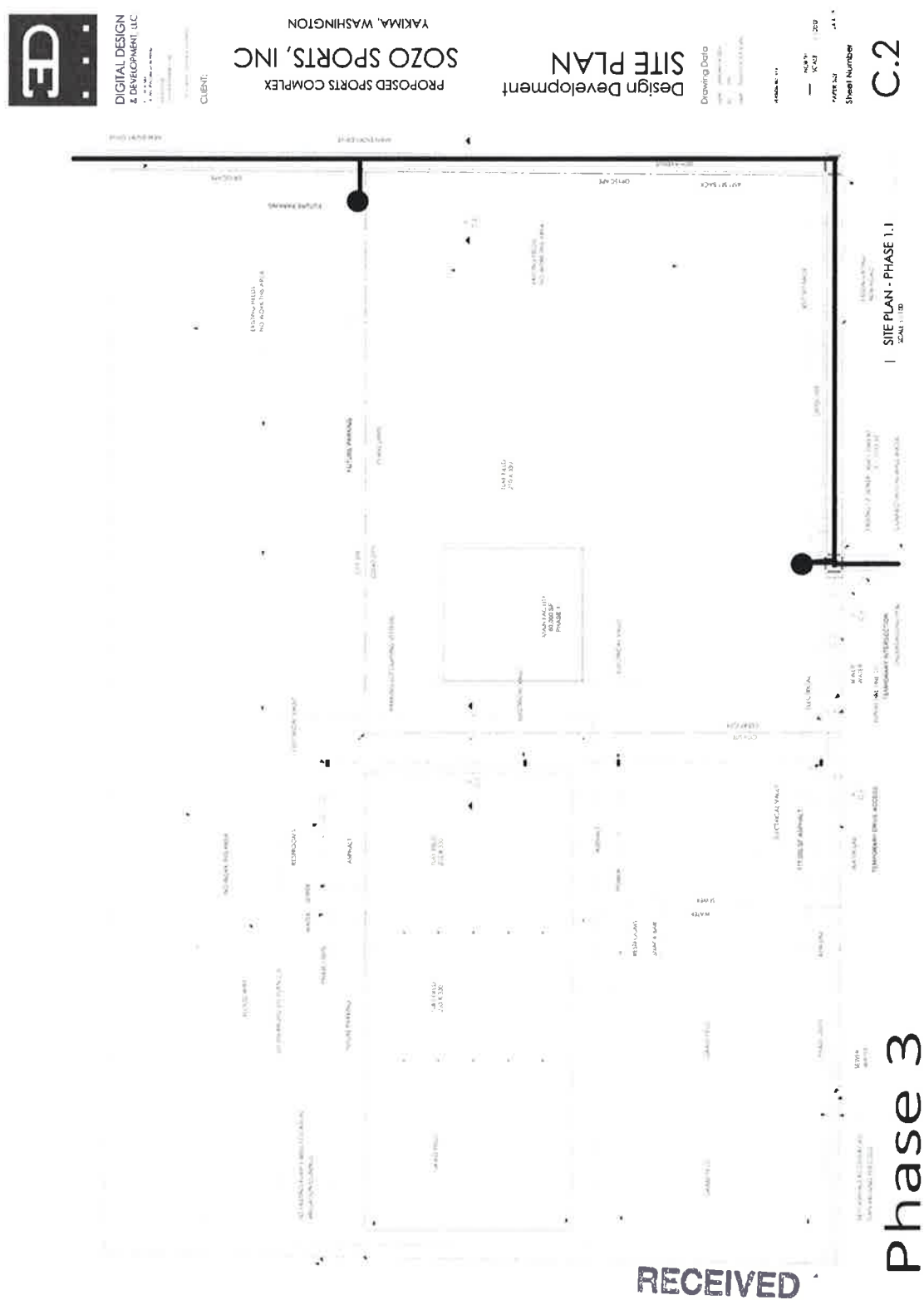
At the time the October 2015 TIA was prepared, it was unclear what level of improvements the City of Yakima was prepared to make along Spring Creek Road and S. 36th Avenue. With the previously noted reconstruction and widening improvements now under formal consideration, a supplemental analysis has been prepared to address the full-build transportation impacts associated with this widening. This analysis was prepared under the following assumptions:

- Spring Creek Road and S. 36th Avenue are reconstructed and fully improved to a three-lane cross section.
- The 58-acre sports complex will be fully built out as documented in the October 2015 TIA.
- A new permanent site access driveway will be constructed off of S. 36th Avenue. The driveway is assumed to include separate left- and right-turn exiting lanes onto S. 36th Avenue while S. 36th Avenue is assumed to include a northbound left-turn lane. Figure 3 displays the full build-out site plan under Scenario #3.
- The temporary site access off of the westerly extension of Sorenson Road will be closed and converted to an emergency access. A secondary site access driveway will be constructed to form the north leg of the S. 38th Avenue/Sorenson Road intersection. It is anticipated that this driveway will be closed off most of the time and open only during special events.

Under these development assumptions, the following questions have been addressed:

1. What are the operational impacts of full build-out of the soccer complex to each of the local streets along Spring Creek Road (assuming the widening of Spring Creek Road)?
2. What are the operational impacts of full build-out of the soccer complex at the proposed main site access off of S. 36th Avenue?
3. What is the recommended geometric configuration at the reconstructed S. 36th Avenue/Sorenson Road intersection?
4. What are the longer-term recommendations at the S. 38th Avenue/Ahtanum Road intersection?

Figure 3 – Phase 3 Full Build Out Site Plan (Prepared by Digital Design & Development)



1. Spring Creek Road Delay Analysis

In order to address traffic concerns raised by the adjacent residential neighborhoods to the north of the soccer complex, a delay analysis was performed at each of the local streets (S. 40th Avenue, S. 41st Avenue, S. 44th Avenue, S. 45th Avenue, and S. 47th Avenue) that access Spring Creek Road between S. 48th Avenue and S. 36th Avenue under full build-out of the proposed sports complex. As described under Phase 1, traffic volumes on Spring Creek Road at each of these five intersections were estimated based on traffic volumes collected at the 48th Avenue/W. Washington Avenue intersection. Additionally, turning movement volumes to/from each side street were estimated based on trip generation estimates (number of residential units served by each local street) obtained from ITE's Trip Generation. Table 3 summarizes the resulting delay analysis at these intersections.

Table 3 - Spring Creek Road Delay Analysis – Full Site Build-out

Intersection		Spring Creek / 40th		Spring Creek / 41st		Spring Creek / 44th		Spring Creek / 45th		Spring Creek / 47th	
Houses		6		16		25		4		23	
Time Period		PM	SAT	PM	SAT	PM	SAT	PM	SAT	PM	SAT
Trip Gen	In	4	3	10	8	16	13	3	2	14	12
	Out	2	3	6	7	9	11	1	2	9	10
Northbound LOS (full-build)		A	A	A	A	A	A	A	A	A	A

As shown in the table, the critical northbound approach at each of the five local streets are forecast to operate with minimal delay (LOS A) during both the weekday PM and Saturday midday peak hours after full build-out of the proposed sports complex and reconstruction of Spring Creek Road. Appendix C contains the Phase 1 operations worksheets for the Spring Creek Road intersections.

2. Site Access Operations (S. 36th Avenue)

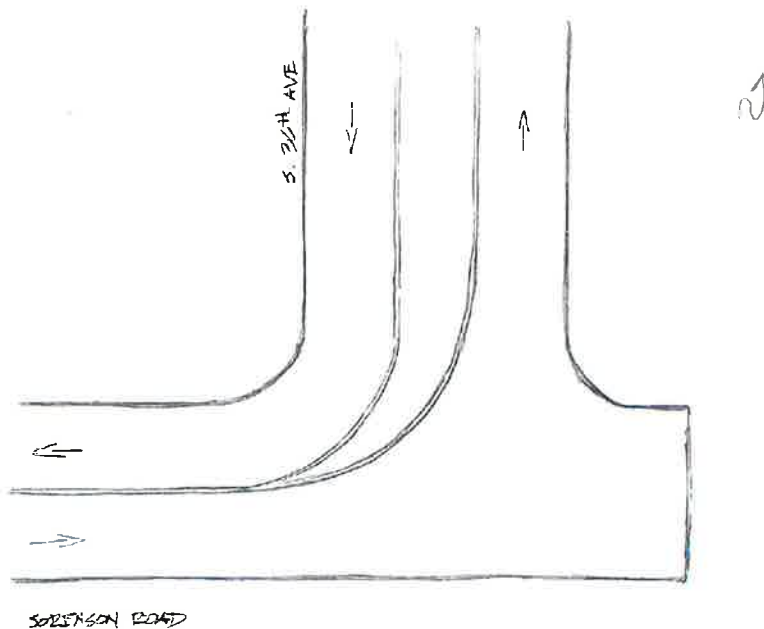
A detailed operations analysis was performed at the proposed main site access off of S. 36th Avenue. Assuming the site access layout that was previously outlined, the critical eastbound left-turn is forecast to operate at LOS B during both the weekday PM peak hour and Saturday midday peak hours after full build-out of the proposed sports complex. Appendix C contains the Phase 3 operations worksheets for the permanent site access driveway on S. 36th Avenue.

3. S. 36th Avenue/Sorenson Road Intersection

S. 36th Avenue and Sorenson Road currently link together through a horizontal curve at a location where there are no turn movements. Upon reconstruction of S. 36th Avenue, it is assumed that the horizontal curve will be reconstructed to form a traditional 90 degree intersection (with a new street stub on the east leg to accommodate a potential easterly extension of Sorenson Road). Until the easterly extension of Sorenson is established, it is recommend that the intersection be left uncontrolled and striped according to the conceptual sketch shown in Exhibit 1 below.

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Exhibit 1 - Conceptual Sketch of the S. 36th Avenue/Sorenson Road Intersection



4. S. 38th Avenue/Ahtanum Road Intersection

As documented in the October 13, 2015 Transportation Impact Analysis (TIA), it was concluded that signalization and widening of the S. 38th Avenue/Ahtanum Road intersection would be needed at the equivalent of 12 or more soccer fields. Given that signalization and widening of the intersection will be needed during the Phase 2 reconstruction of Spring Creek Road and S. 36th Avenue, it is recommended that this signalization remain following Phase 2. At some point in the future if/when an easterly extension of Sorenson Road connects to Ahtanum Road (via a new north/south roadway), the need for continued signalization of the S. 38th Avenue/Ahtanum Road intersection can be revisited by Yakima County.

We trust this document adequately addresses the supplemental questions regarding the traffic impacts associated with the proposed Yakima Sports Complex. Please contact us if you have any questions.

Sincerely,
KITTELSON & ASSOCIATES, INC.

Matt Hugart, AICP
Associate Planner

Julia Kuhn, PE
Principal Engineer



Appendix A Phase 1 Operations
Worksheets










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Yakima Sports Complex
5: Ahtanum Rd & 38th Ave

Phase 1 PM
2/4/2016

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	353	542	100	86	22
Future Volume (Veh/h)	13	353	542	100	86	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	13	353	542	100	86	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	642				971	592
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	642				971	592
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	99				69	96
cM capacity (veh/h)	914				276	510
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	366	642	108			
Volume Left	13	0	86			
Volume Right	0	100	22			
cSH	914	1700	305			
Volume to Capacity	0.01	0.38	0.35			
Queue Length 95th (ft)	1	0	39			
Control Delay (s)	0.5	0.0	23.1			
Lane LOS	A		C			
Approach Delay (s)	0.5	0.0	23.1			
Approach LOS			C			
Intersection Summary						
Average Delay		2.4				
Intersection Capacity Utilization		47.4%	ICU Level of Service	A		
Analysis Period (min)		15				

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Yakima Sports Complex
11: 38th Ave & Sorenson Rd

Phase 1 - PM
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↱	
Traffic Volume (veh/h)	23	23	65	47	47	26
Future Volume (Veh/h)	23	23	65	47	47	26
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	23	65	47	47	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			46		212	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			46		212	34
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		94	97
cM capacity (veh/h)			1562		744	1039
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	46	112	73			
Volume Left	0	65	47			
Volume Right	23	0	26			
cSH	1700	1562	828			
Volume to Capacity	0.03	0.04	0.09			
Queue Length 95th (ft)	0	3	7			
Control Delay (s)	0.0	4.4	9.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	4.4	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization			23.6%	ICU Level of Service		A
Analysis Period (min)			15			

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Yakima Sports Complex
8: S 47th Ave & Spring Creek Rd

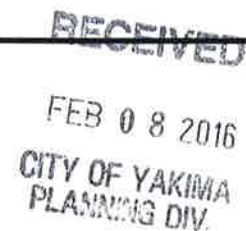
Phase 1 PM
2/4/2016

	→	↘	↙	←	↗	↖
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↗	↗	
Traffic Volume (veh/h)	99	7	7	114	5	4
Future Volume (Veh/h)	99	7	7	114	5	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	108	8	8	124	5	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			116		252	112
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			116		252	112
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1485		737	947
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	116	132	9			
Volume Left	0	8	5			
Volume Right	8	0	4			
cSH	1700	1485	817			
Volume to Capacity	0.07	0.01	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.5	9.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.5	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		21.7%		ICU Level of Service		A
Analysis Period (min)		15				

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	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↖	↗	
Traffic Volume (veh/h)	101	2	1	120	1	0
Future Volume (Veh/h)	101	2	1	120	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	2	1	130	1	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			112		243	111
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			112		243	111
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1490		749	948
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	112	131	1			
Volume Left	0	1	1			
Volume Right	2	0	0			
cSH	1700	1490	749			
Volume to Capacity	0.07	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.1	9.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			17.1%	ICU Level of Service		A
Analysis Period (min)			15			



Yakima Sports Complex
28: S 44th Ave & Spring Creek Rd










Phase 1 PM
2/4/2016

	→	↘	↙	←	↗	↖
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↰	↰	↰
Traffic Volume (veh/h)	93	8	8	116	5	4
Future Volume (Veh/h)	93	8	8	116	5	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	101	9	9	126	5	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			110		250	106
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			110		250	106
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1493		739	954
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	110	135	9			
Volume Left	0	9	5			
Volume Right	9	0	4			
cSH	1700	1493	821			
Volume to Capacity	0.06	0.01	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.5	9.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.5	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			22.7%	ICU Level of Service		A
Analysis Period (min)			15			

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Yakima Sports Complex
30: S 41st Ave & Spring Creek Rd

Phase 1 PM
2/4/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	92	5	5	128	6	5
Future Volume (Veh/h)	92	5	5	128	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	5	5	139	7	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			105		252	102
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			105		252	102
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1499		739	958
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	105	144	12			
Volume Left	0	5	7			
Volume Right	5	0	5			
cSH	1700	1499	817			
Volume to Capacity	0.06	0.00	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.3	9.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.3	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		20.8%	ICU Level of Service	A		
Analysis Period (min)		15				

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Yakima Sports Complex
32: S 40th Ave & Spring Creek Rd

Phase 1 PM
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	95	2	2	122	1	1
Future Volume (Veh/h)	95	2	2	122	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	2	2	133	1	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			105		241	104
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			105		241	104
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1499		751	956
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	105	135	2			
Volume Left	0	2	1			
Volume Right	2	0	1			
cSH	1700	1499	841			
Volume to Capacity	0.06	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.1	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay		0.1				
Intersection Capacity Utilization		18.0%	ICU Level of Service	A		
Analysis Period (min)		15				

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Yakima Sports Complex
2: W Washington Ave & S 48th Ave










Phase 1 PM
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	↖	↗	↑	↘	↙	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑		↘	↑↑
Traffic Volume (veh/h)	9	111	570	34	71	900
Future Volume (Veh/h)	9	111	570	34	71	900
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	111	570	34	71	900
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1180	303			605	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1180	303			605	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	84			93	
cM capacity (veh/h)	172	698			955	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	120	380	224	71	450	450
Volume Left	9	0	0	71	0	0
Volume Right	111	0	34	0	0	0
cSH	568	1700	1700	955	1700	1700
Volume to Capacity	0.21	0.22	0.13	0.07	0.26	0.26
Queue Length 95th (ft)	20	0	0	6	0	0
Control Delay (s)	13.0	0.0	0.0	9.1	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	13.0	0.0		0.7		
Approach LOS	B					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			38.9%	ICU Level of Service		A
Analysis Period (min)			15			

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Yakima Sports Complex
5: Ahtanum Rd & 38th Ave

Phase 1 - Saturday
2/4/2016

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	418	276	72	73	18
Future Volume (Veh/h)	18	418	276	72	73	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	18	418	276	72	73	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	348				766	312
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	348				766	312
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	98				80	98
cM capacity (veh/h)	1178				365	733
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	436	348	91			
Volume Left	18	0	73			
Volume Right	0	72	18			
cSH	1178	1700	405			
Volume to Capacity	0.02	0.20	0.22			
Queue Length 95th (ft)	1	0	21			
Control Delay (s)	0.5	0.0	16.4			
Lane LOS	A		C			
Approach Delay (s)	0.5	0.0	16.4			
Approach LOS			C			
Intersection Summary						
Average Delay		2.0				
Intersection Capacity Utilization		48.4%		ICU Level of Service	A	
Analysis Period (min)		15				

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	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↖	↗	
Traffic Volume (veh/h)	63	63	62	58	58	39
Future Volume (Veh/h)	63	63	62	58	58	39
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	63	63	62	58	58	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			126		276	94
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			126		276	94
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		92	96
cM capacity (veh/h)			1460		683	962
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	126	120	97			
Volume Left	0	62	58			
Volume Right	63	0	39			
cSH	1700	1460	773			
Volume to Capacity	0.07	0.04	0.13			
Queue Length 95th (ft)	0	3	11			
Control Delay (s)	0.0	4.1	10.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	4.1	10.3			
Approach LOS			B			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			29.3%	ICU Level of Service		A
Analysis Period (min)			15			

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Yakima Sports Complex
8: S 47th Ave & Spring Creek Rd

Phase 1 - Saturday
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Traffic Volume (veh/h)	74	6	6	91	5	5
Future Volume (Veh/h)	74	6	6	91	5	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	7	7	99	5	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			87		196	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		196	84
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1522		793	981
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	87	106	10			
Volume Left	0	7	5			
Volume Right	7	0	5			
cSH	1700	1522	877			
Volume to Capacity	0.05	0.00	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.5	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.5	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		19.7%	ICU Level of Service	A		
Analysis Period (min)		15				

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Yakima Sports Complex
26: S 45th Ave & Spring Creek Rd

Phase 1 - Saturday
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	78	1	1	96	1	1
Future Volume (Veh/h)	78	1	1	96	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	85	1	1	104	1	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			86		192	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			86		192	86
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1523		801	979
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	86	105	2			
Volume Left	0	1	1			
Volume Right	1	0	1			
cSH	1700	1523	881			
Volume to Capacity	0.05	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.1	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			15.8%	ICU Level of Service	A	
Analysis Period (min)			15			










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CITY OF YAKIMA
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Yakima Sports Complex
28: S 44th Ave & Spring Creek Rd

Phase 1 - Saturday
2/4/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	82	7	6	89	6	5
Future Volume (Veh/h)	82	7	6	89	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	8	7	97	7	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			97		204	93
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			97		204	93
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1509		785	970
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	97	104	12			
Volume Left	0	7	7			
Volume Right	8	0	5			
cSH	1700	1509	853			
Volume to Capacity	0.06	0.00	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.5	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.5	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay		0.8				
Intersection Capacity Utilization		19.6%	ICU Level of Service	A		
Analysis Period (min)		15				

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CITY OF YAKIMA
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Yakima Sports Complex
30: S 41st Ave & Spring Creek Rd

Phase 1 - Saturday
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EST	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	
Traffic Volume (veh/h)	83	4	4	95	4	3
Future Volume (Veh/h)	83	4	4	95	4	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	4	4	103	4	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			94		203	92
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			94		203	92
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1513		788	971
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	94	107	7			
Volume Left	0	4	4			
Volume Right	4	0	3			
cSH	1700	1513	857			
Volume to Capacity	0.06	0.00	0.01			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.3	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.3	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			18.2%	ICU Level of Service		A
Analysis Period (min)			15			

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Yakima Sports Complex
32: S 40th Ave & Spring Creek Rd

Phase 1 - Saturday
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1			1	2	
Traffic Volume (veh/h)	84	2	1	97	2	1
Future Volume (Veh/h)	84	2	1	97	2	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	91	2	1	105	2	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			93		199	92
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			93		199	92
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1514		794	971
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	93	106	3			
Volume Left	0	1	2			
Volume Right	2	0	1			
cSH	1700	1514	845			
Volume to Capacity	0.05	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.1	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.1	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay		0.2				
Intersection Capacity Utilization		15.9%		ICU Level of Service		A
Analysis Period (min)		15				

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Yakima Sports Complex
2: W Washington Ave & S 48th Ave

Phase 1 - Saturday
2/4/2016

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖		↗		↘	↗
Traffic Volume (veh/h)	21	75	495	29	72	395
Future Volume (Veh/h)	21	75	495	29	72	395
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	21	75	495	29	72	395
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	852	263			525	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	852	263			525	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	90			93	
cM capacity (veh/h)	281	741			1023	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	96	330	194	72	198	198
Volume Left	21	0	0	72	0	0
Volume Right	75	0	29	0	0	0
cSH	546	1700	1700	1023	1700	1700
Volume to Capacity	0.18	0.19	0.11	0.07	0.12	0.12
Queue Length 95th (ft)	16	0	0	6	0	0
Control Delay (s)	13.0	0.0	0.0	8.8	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	13.0	0.0		1.4		
Approach LOS	B					
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		34.4%		ICU Level of Service		A
Analysis Period (min)		15				

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KITTELSON & ASSOCIATES, INC.

610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Project #: 19056
Project Name: SOZO Sports
Analyst: BHR
Date: 2/4/2016
File:

K:\p\Portland\proj\19056 - Yakima Sports Complex\Signal Warrants\Ahtanum_MM\Signal Warrant Analysis_Phase 1.xls>Data Input

Intersection: Ahtanum Road/S 38th Ave
Scenario: Phase 1

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	minor
East-West Approach =	Major
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Daily

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
12:00 AM	1:00 AM	10	25	0	2
1:00 AM	2:00 AM	7	13	0	2
2:00 AM	3:00 AM	11	25	0	2
3:00 AM	4:00 AM	25	15	0	1
4:00 AM	5:00 AM	76	115	0	10
5:00 AM	6:00 AM	168	190	0	21
6:00 AM	7:00 AM	377	166	0	36
7:00 AM	8:00 AM	548	176	0	59
8:00 AM	9:00 AM	359	193	0	44
9:00 AM	10:00 AM	276	214	0	41
10:00 AM	11:00 AM	247	253	0	47
11:00 AM	12:00 PM	242	278	0	54
12:00 PM	1:00 PM	249	289	0	49
1:00 PM	2:00 PM	248	294	0	28
2:00 PM	3:00 PM	317	381	0	40
3:00 PM	4:00 PM	325	491	0	64
4:00 PM	5:00 PM	335	542	0	62
5:00 PM	6:00 PM	332	522	0	67
6:00 PM	7:00 PM	195	350	0	31
7:00 PM	8:00 PM	175	204	0	36
8:00 PM	9:00 PM	119	195	0	18
9:00 PM	10:00 PM	109	183	0	18
10:00 PM	11:00 PM	72	85	0	12
11:00 PM	12:00 AM	29	61	0	5

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	500	150	0	No	No
	B	750	75	0	No	
80%	A	400	120	0	No	No
	B	600	60	3	No	
70%	A	350	105	0	No	No
	B	525	53	4	No	

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Appendix B Phase 2 Operations
Worksheets

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Yakima Sports Complex
5: Ahtanum Rd & 38th Ave

Phase 2 PM
2/4/2016

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	353	542	131	173	27
Future Volume (Veh/h)	40	353	542	131	173	27
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	40	353	542	131	173	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	673				1040	608
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	673				1040	608
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	96				29	95
cM capacity (veh/h)	890				243	500
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	393	673	200			
Volume Left	40	0	173			
Volume Right	0	131	27			
cSH	890	1700	262			
Volume to Capacity	0.04	0.40	0.76			
Queue Length 95th (ft)	4	0	141			
Control Delay (s)	1.4	0.0	52.6			
Lane LOS	A		F			
Approach Delay (s)	1.4	0.0	52.6			
Approach LOS			F			
Intersection Summary						
Average Delay		8.8				
Intersection Capacity Utilization		69.9%		ICU Level of Service		C
Analysis Period (min)		15				

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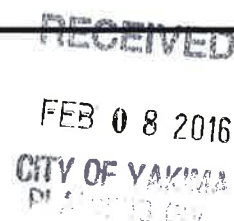
CITY OF YAKIMA
PLANNING DIV

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↖	↗	
Traffic Volume (veh/h)	0	47	133	0	95	38
Future Volume (Veh/h)	0	47	133	0	95	38
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	47	133	0	95	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			47		290	24
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			47		290	24
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		85	96
cM capacity (veh/h)			1560		641	1053
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	47	133	133			
Volume Left	0	133	95			
Volume Right	47	0	38			
cSH	1700	1560	722			
Volume to Capacity	0.03	0.09	0.18			
Queue Length 95th (ft)	0	7	17			
Control Delay (s)	0.0	7.5	11.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	7.5	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay		7.9				
Intersection Capacity Utilization		28.3%		ICU Level of Service	A	
Analysis Period (min)		15				

Yakima Sports Complex
5: Ahtanum Rd & 38th Ave

Phase 2 - Saturday
2/4/2016

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	41	418	276	112	121	34
Future Volume (Veh/h)	41	418	276	112	121	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	41	418	276	112	121	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	388				832	332
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	388				832	332
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	96				63	95
cM capacity (veh/h)	1138				327	714
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	459	388	155			
Volume Left	41	0	121			
Volume Right	0	112	34			
cSH	1138	1700	371			
Volume to Capacity	0.04	0.23	0.42			
Queue Length 95th (ft)	3	0	50			
Control Delay (s)	1.1	0.0	21.5			
Lane LOS	A		C			
Approach Delay (s)	1.1	0.0	21.5			
Approach LOS			C			
Intersection Summary						
Average Delay		3.8				
Intersection Capacity Utilization		64.4%		ICU Level of Service		C
Analysis Period (min)		15				



	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	🚦			🚦	🚦	
Traffic Volume (veh/h)	0	126	6	0	117	10
Future Volume (Veh/h)	0	126	6	0	117	10
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	126	6	0	117	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			126		75	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			126		75	63
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		87	99
cM capacity (veh/h)			1460		925	1002
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	126	6	127			
Volume Left	0	6	117			
Volume Right	126	0	10			
cSH	1700	1460	930			
Volume to Capacity	0.07	0.00	0.14			
Queue Length 95th (ft)	0	0	12			
Control Delay (s)	0.0	7.5	9.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	7.5	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay		4.8				
Intersection Capacity Utilization		21.6%		ICU Level of Service		A
Analysis Period (min)		15				

**KITTELSON & ASSOCIATES, INC.**

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 Portland, Oregon 97205
 (503) 228-5230
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Project #: 19056
Project Name: SOZO Sports
Analyst: BHR
Date: 2/4/2016
File:

\\fs1_portland\proj\19056 - Sozo Sports Comp\19056\Signal Warrants\Ahtanum_Road_Signal Warrant_Analysis_Phase 2_AltData Input

Intersection: Ahtanum Road/S 38th Ave
Scenario: Phase 2

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes*
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	minor
East-West Approach =	Major
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Daily

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
12:00 AM	1:00 AM	11	26	0	6
1:00 AM	2:00 AM	8	14	0	4
2:00 AM	3:00 AM	12	26	0	6
3:00 AM	4:00 AM	26	16	0	5
4:00 AM	5:00 AM	82	122	0	30
5:00 AM	6:00 AM	179	203	0	59
6:00 AM	7:00 AM	394	185	0	93
7:00 AM	8:00 AM	571	202	0	136
8:00 AM	9:00 AM	376	213	0	102
9:00 AM	10:00 AM	291	232	0	93
10:00 AM	11:00 AM	263	271	0	101
11:00 AM	12:00 PM	259	297	0	110
12:00 PM	1:00 PM	266	308	0	107
1:00 PM	2:00 PM	264	313	0	84
2:00 PM	3:00 PM	338	405	0	112
3:00 PM	4:00 PM	350	520	0	150
4:00 PM	5:00 PM	362	573	0	154
5:00 PM	6:00 PM	358	553	0	157
6:00 PM	7:00 PM	212	369	0	88
7:00 PM	8:00 PM	187	218	0	77
8:00 PM	9:00 PM	128	206	0	51
9:00 PM	10:00 PM	118	193	0	48
10:00 PM	11:00 PM	77	90	0	29
11:00 PM	12:00 AM	31	65	0	15

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	500	150	3	No	No
	B	750	75	4	No	
80%	A	400	120	4	No	No
	B	600	60	5	No	
70%	A	350	105	7	No	Yes
	B	525	53	12	Yes	

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Appendix C Phase 3 Operations
Worksheets

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Yakima Sports Complex
5: Ahtanum Rd & S 38th Ave

Phase 3 PM
2/4/2016

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	353	542	158	115	26
Future Volume (Veh/h)	19	353	542	158	115	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	19	353	542	158	115	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	700				1012	621
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	700				1012	621
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	98				56	95
cM capacity (veh/h)	870				259	491
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	372	700	141			
Volume Left	19	0	115			
Volume Right	0	158	26			
cSH	870	1700	284			
Volume to Capacity	0.02	0.41	0.50			
Queue Length 95th (ft)	2	0	65			
Control Delay (s)	0.7	0.0	29.5			
Lane LOS	A		D			
Approach Delay (s)	0.7	0.0	29.5			
Approach LOS			D			
Intersection Summary						
Average Delay		3.7				
Intersection Capacity Utilization		52.8%		ICU Level of Service		A
Analysis Period (min)		15				

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Yakima Sports Complex
11: 38th Ave & Sorenson Rd











Phase 3 - PM
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	
Traffic Volume (veh/h)	0	0	120	0	0	139
Future Volume (Veh/h)	0	0	120	0	0	139
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	120	0	0	139
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		240	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		240	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	87
cM capacity (veh/h)			1623		693	1085
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	120	139			
Volume Left	0	120	0			
Volume Right	0	0	139			
cSH	1700	1623	1085			
Volume to Capacity	0.00	0.07	0.13			
Queue Length 95th (ft)	0	6	11			
Control Delay (s)	0.0	7.4	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	7.4	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay		8.2				
Intersection Capacity Utilization		21.9%	ICU Level of Service	A		
Analysis Period (min)		15				

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Yakima Sports Complex
7: S 36th Ave & Permanent Site Access

Phase 3 PM
2/4/2016

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	56	112	65	85	113
Future Volume (Veh/h)	55	56	112	65	85	113
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	69	70	140	81	106	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	538	176	247			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	538	176	247			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	92	89			
cM capacity (veh/h)	454	872	1331			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	69	70	221	247		
Volume Left	69	0	140	0		
Volume Right	0	70	0	141		
cSH	454	872	1331	1700		
Volume to Capacity	0.15	0.08	0.11	0.15		
Queue Length 95th (ft)	13	7	9	0		
Control Delay (s)	14.3	9.5	5.4	0.0		
Lane LOS	B	A	A			
Approach Delay (s)	11.9		5.4	0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			4.7			
Intersection Capacity Utilization			34.4%	ICU Level of Service		A
Analysis Period (min)			15			

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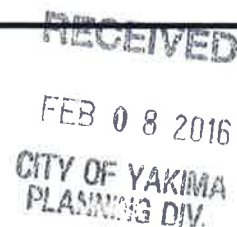
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CITY OF YAKIMA
PLANNING DIV.

Yakima Sports Complex
8: S 47th Ave & Spring Creek Rd

Phase 3 PM
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (veh/h)	164	7	7	146	5	4
Future Volume (Veh/h)	164	7	7	146	5	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	178	8	8	159	5	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			186		357	182
vC1, stage 1 conf vol					182	
vC2, stage 2 conf vol					175	
vCu, unblocked vol			186		357	182
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1401		765	866
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	186	8	159	9		
Volume Left	0	8	0	5		
Volume Right	8	0	0	4		
cSH	1700	1401	1700	807		
Volume to Capacity	0.11	0.01	0.09	0.01		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s)	0.0	7.6	0.0	9.5		
Lane LOS		A		A		
Approach Delay (s)	0.0	0.4		9.5		
Approach LOS				A		
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			19.1%	ICU Level of Service		A
Analysis Period (min)			15			



Yakima Sports Complex
26: S 45th Ave & Spring Creek Rd

Phase 3 PM
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↰	↰	↰	
Traffic Volume (veh/h)	166	2	1	152	1	0
Future Volume (Veh/h)	166	2	1	152	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	180	2	1	165	1	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			182		348	181
vC1, stage 1 conf vol					181	
vC2, stage 2 conf vol					167	
vCu, unblocked vol			182		348	181
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1405		773	867
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	182	1	165	1		
Volume Left	0	1	0	1		
Volume Right	2	0	0	0		
cSH	1700	1405	1700	773		
Volume to Capacity	0.11	0.00	0.10	0.00		
Queue Length 95th (ft)	0	0	0	0		
Control Delay (s)	0.0	7.6	0.0	9.7		
Lane LOS		A		A		
Approach Delay (s)	0.0	0.0		9.7		
Approach LOS				A		
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			18.9%	ICU Level of Service		A
Analysis Period (min)			15			

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CITY OF YAKIMA
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Yakima Sports Complex
28: S 44th Ave & Spring Creek Rd

Phase 3 PM
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (veh/h)	158	8	8	148	5	4
Future Volume (Veh/h)	158	8	8	148	5	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	172	9	9	161	5	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			181		356	176
vC1, stage 1 conf vol					176	
vC2, stage 2 conf vol					179	
vCu, unblocked vol			181		356	176
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1407		766	872
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	181	9	161	9		
Volume Left	0	9	0	5		
Volume Right	9	0	0	4		
cSH	1700	1407	1700	809		
Volume to Capacity	0.11	0.01	0.09	0.01		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s)	0.0	7.6	0.0	9.5		
Lane LOS		A		A		
Approach Delay (s)	0.0	0.4		9.5		
Approach LOS				A		
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			18.8%	ICU Level of Service		A
Analysis Period (min)			15			

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CITY OF YAKIMA
PLANNING DIV.

Yakima Sports Complex
30: S 41st Ave & Spring Creek Rd

Phase 3 PM
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻		↻	↻	↻	
Traffic Volume (veh/h)	157	5	5	150	6	5
Future Volume (Veh/h)	157	5	5	150	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	171	5	5	163	7	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage (veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			176		346	174
vC1, stage 1 conf vol					174	
vC2, stage 2 conf vol					173	
vCu, unblocked vol			176		346	174
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1412		772	875
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	176	5	163	12		
Volume Left	0	5	0	7		
Volume Right	5	0	0	5		
cSH	1700	1412	1700	812		
Volume to Capacity	0.10	0.00	0.10	0.01		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s)	0.0	7.6	0.0	9.5		
Lane LOS		A		A		
Approach Delay (s)	0.0	0.2		9.5		
Approach LOS				A		
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			18.6%	ICU Level of Service		A
Analysis Period (min)			15			

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CITY OF YAKIMA
PLANNING DIV.

Yakima Sports Complex
32: S 40th Ave & Spring Creek Rd

Phase 3 PM
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (veh/h)	160	2	2	154	1	1
Future Volume (Veh/h)	160	2	2	154	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	174	2	2	167	1	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			176		346	175
vC1, stage 1 conf vol					175	
vC2, stage 2 conf vol					171	
vCu, unblocked vol			176		346	175
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1412		773	874
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	176	2	167	2		
Volume Left	0	2	0	1		
Volume Right	2	0	0	1		
cSH	1700	1412	1700	820		
Volume to Capacity	0.10	0.00	0.10	0.00		
Queue Length 95th (ft)	0	0	0	0		
Control Delay (s)	0.0	7.6	0.0	9.4		
Lane LOS		A		A		
Approach Delay (s)	0.0	0.1		9.4		
Approach LOS				A		
Intersection Summary						
Average Delay		0.1				
Intersection Capacity Utilization		18.5%		ICU Level of Service		A
Analysis Period (min)		15				










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CITY OF YAKIMA
PLANNING DIV.

Yakima Sports Complex
5: Ahtanum Rd & 38th Ave

Phase 3 - Saturday
2/4/2016

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	418	276	144	151	27
Future Volume (Veh/h)	26	418	276	144	151	27
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	418	276	144	151	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	420				818	348
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	420				818	348
tC, single (s)	4.2				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	98				55	96
cM capacity (veh/h)	1108				337	700
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	444	420	178			
Volume Left	26	0	151			
Volume Right	0	144	27			
cSH	1108	1700	366			
Volume to Capacity	0.02	0.25	0.49			
Queue Length 95th (ft)	2	0	64			
Control Delay (s)	0.7	0.0	23.8			
Lane LOS	A		C			
Approach Delay (s)	0.7	0.0	23.8			
Approach LOS			C			
Intersection Summary						
Average Delay		4.4				
Intersection Capacity Utilization		60.0%		ICU Level of Service	B	
Analysis Period (min)		15				

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


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CITY OF YAKIMA
PLANNING DIV.

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↰	↰	
Traffic Volume (veh/h)	0	0	212	0	0	177
Future Volume (Veh/h)	0	0	212	0	0	177
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	212	0	0	177
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		424	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		424	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			87		100	84
cM capacity (veh/h)			1623		510	1085
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	212	177			
Volume Left	0	212	0			
Volume Right	0	0	177			
cSH	1700	1623	1085			
Volume to Capacity	0.00	0.13	0.16			
Queue Length 95th (ft)	0	11	15			
Control Delay (s)	0.0	7.6	9.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	7.6	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay		8.2				
Intersection Capacity Utilization		29.4%		ICU Level of Service		A
Analysis Period (min)		15				

Yakima Sports Complex
7: S 36th Ave & Permanent Site Access

Phase 3 - Saturday
2/4/2016

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	150	150	138	32	28	138
Future Volume (Veh/h)	150	150	138	32	28	138
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	188	188	173	40	35	173
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	508	122	208			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	508	122	208			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	59	80	87			
cM capacity (veh/h)	462	935	1375			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	188	188	213	208		
Volume Left	188	0	173	0		
Volume Right	0	188	0	173		
cSH	462	935	1375	1700		
Volume to Capacity	0.41	0.20	0.13	0.12		
Queue Length 95th (ft)	49	19	11	0		
Control Delay (s)	18.0	9.8	6.7	0.0		
Lane LOS	C	A	A			
Approach Delay (s)	13.9		6.7	0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			8.4			
Intersection Capacity Utilization			37.6%	ICU Level of Service	A	
Analysis Period (min)			15			

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CITY OF YAKIMA
PLANNING DIV.

Yakima Sports Complex
8: S 47th Ave & Spring Creek Rd

Phase 3 - Saturday
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	
Traffic Volume (veh/h)	154	6	6	178	5	5
Future Volume (Veh/h)	154	6	6	178	5	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	167	7	7	193	5	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			174		378	170
vC1, stage 1 conf vol					170	
vC2, stage 2 conf vol					207	
vCu, unblocked vol			174		378	170
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1415		753	879
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	174	7	193	10		
Volume Left	0	7	0	5		
Volume Right	7	0	0	5		
cSH	1700	1415	1700	811		
Volume to Capacity	0.10	0.00	0.11	0.01		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s)	0.0	7.6	0.0	9.5		
Lane LOS		A		A		
Approach Delay (s)	0.0	0.3		9.5		
Approach LOS				A		
Intersection Summary						
Average Delay		0.4				
Intersection Capacity Utilization		19.4%		ICU Level of Service		A
Analysis Period (min)		15				

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CITY OF YAKIMA
PLANNING DIV.

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↖	↘	
Traffic Volume (veh/h)	158	1	1	183	1	1
Future Volume (Veh/h)	158	1	1	183	1	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	172	1	1	199	1	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			173		374	172
vC1, stage 1 conf vol					172	
vC2, stage 2 conf vol					201	
vCu, unblocked vol			173		374	172
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1416		758	876
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	173	1	199	2		
Volume Left	0	1	0	1		
Volume Right	1	0	0	1		
cSH	1700	1416	1700	813		
Volume to Capacity	0.10	0.00	0.12	0.00		
Queue Length 95th (ft)	0	0	0	0		
Control Delay (s)	0.0	7.5	0.0	9.4		
Lane LOS		A		A		
Approach Delay (s)	0.0	0.0		9.4		
Approach LOS				A		
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			19.6%	ICU Level of Service		A
Analysis Period (min)			15			

Yakima Sports Complex
28: S 44th Ave & Spring Creek Rd

Phase 3 - Saturday
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖		↘	↖	↘	
Traffic Volume (veh/h)	162	7	6	178	6	5
Future Volume (Veh/h)	162	7	6	178	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	176	8	7	193	7	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			184		387	180
vC1, stage 1 conf vol					180	
vC2, stage 2 conf vol					207	
vCu, unblocked vol			184		387	180
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1403		748	868
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	184	7	193	12		
Volume Left	0	7	0	7		
Volume Right	8	0	0	5		
cSH	1700	1403	1700	794		
Volume to Capacity	0.11	0.00	0.11	0.02		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s)	0.0	7.6	0.0	9.6		
Lane LOS		A		A		
Approach Delay (s)	0.0	0.3		9.6		
Approach LOS				A		
Intersection Summary						
Average Delay		0.4				
Intersection Capacity Utilization		19.4%		ICU Level of Service		A
Analysis Period (min)		15				

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CITY OF YAKIMA
PLANNING DIV.

Yakima Sports Complex
30: S 41st Ave & Spring Creek Rd

Phase 3 - Saturday
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰		↰	↰	↰	
Traffic Volume (veh/h)	163	4	4	182	4	3
Future Volume (Veh/h)	163	4	4	182	4	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	177	4	4	198	4	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			181		385	179
vC1, stage 1 conf vol					179	
vC2, stage 2 conf vol					206	
vCu, unblocked vol			181		385	179
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1407		750	869
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	181	4	198	7		
Volume Left	0	4	0	4		
Volume Right	4	0	0	3		
cSH	1700	1407	1700	797		
Volume to Capacity	0.11	0.00	0.12	0.01		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s)	0.0	7.6	0.0	9.6		
Lane LOS		A		A		
Approach Delay (s)	0.0	0.1		9.6		
Approach LOS				A		
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			19.6%	ICU Level of Service		A
Analysis Period (min)			15			

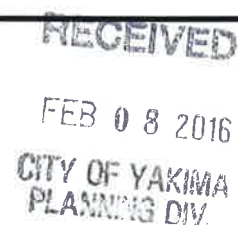
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CITY OF YAKIMA
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Yakima Sports Complex
32: S 40th Ave & Spring Creek Rd

Phase 3 - Saturday
2/4/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↗	↖	
Traffic Volume (veh/h)	164	2	1	184	2	1
Future Volume (Veh/h)	164	2	1	184	2	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	178	2	1	200	2	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh)	2			2		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			180		381	179
vC1, stage 1 conf vol					179	
vC2, stage 2 conf vol					202	
vCu, unblocked vol			180		381	179
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1408		754	869
Direction, Lane #	EB 1	WB 1	WB 2	NB 1		
Volume Total	180	1	200	3		
Volume Left	0	1	0	2		
Volume Right	2	0	0	1		
cSH	1700	1408	1700	789		
Volume to Capacity	0.11	0.00	0.12	0.00		
Queue Length 95th (ft)	0	0	0	0		
Control Delay (s)	0.0	7.6	0.0	9.6		
Lane LOS		A		A		
Approach Delay (s)	0.0	0.0		9.6		
Approach LOS				A		
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			19.7%	ICU Level of Service		A
Analysis Period (min)			15			



**KITTELSON & ASSOCIATES, INC.**

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 Portland, Oregon 97205
 (503) 228-5230
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Project #: 19056
Project Name: SOZO Sports
Analyst: BHR
Date: 2/4/2016
File:

K:\19_Personal\gms\19056 - Yakima Sports Complex\Signal Warrants\Ahtanum_BNV\Signal Warrant Analysis_Phase 3 Ahtanum Input

Intersection: Ahtanum Road/S 38th Ave
Scenario: Phase 3

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes*
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	minor
East-West Approach =	Major
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Daily

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
12:00 AM	1:00 AM	10	27	0	3
1:00 AM	2:00 AM	7	14	0	2
2:00 AM	3:00 AM	11	27	0	3
3:00 AM	4:00 AM	25	17	0	2
4:00 AM	5:00 AM	77	128	0	17
5:00 AM	6:00 AM	170	214	0	35
6:00 AM	7:00 AM	381	201	0	57
7:00 AM	8:00 AM	553	224	0	87
8:00 AM	9:00 AM	363	230	0	65
9:00 AM	10:00 AM	279	247	0	60
10:00 AM	11:00 AM	250	287	0	67
11:00 AM	12:00 PM	246	314	0	74
12:00 PM	1:00 PM	253	325	0	70
1:00 PM	2:00 PM	252	329	0	48
2:00 PM	3:00 PM	322	426	0	66
3:00 PM	4:00 PM	330	546	0	94
4:00 PM	5:00 PM	341	600	0	95
5:00 PM	6:00 PM	338	579	0	99
6:00 PM	7:00 PM	199	386	0	51
7:00 PM	8:00 PM	178	230	0	51
8:00 PM	9:00 PM	121	216	0	30
9:00 PM	10:00 PM	111	202	0	28
10:00 PM	11:00 PM	73	95	0	18
11:00 PM	12:00 AM	29	67	0	9

Warrant #1 - Eight Hour

Warrant Factor	Condition	Major Street Requirement	Minor Street Requirement	Hours That Condition Is Met	Condition for Warrant Factor Met?	Signal Warrant Met?
100%	A	500	150	0	No	No
	B	750	75	4	No	
80%	A	400	120	0	No	No
	B	600	60	5	No	
70%	A	350	105	0	No	Yes
	B	525	53	11	Yes	

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DEPARTMENT OF PUBLIC SERVICES

128 North Second Street · Fourth Floor Courthouse · Yakima, Washington 98901
(509) 574-2260 In-State 1-800-572-7354 · FAX (509) 574-2231 · www.co.yakima.wa.us
VERN M. REDIFER, P.E., Director

December 17, 2015

Joan Davenport, AICP
City of Yakima
129 N. 2nd Street
Yakima, Washington 98901

Dear Mrs. Davenport:

SUBJECT: Review of the Draft MDNS and Traffic Study for the SOZO Sports Multi-Sport Complex

Yakima County has reviewed that draft Mitigated Determination of Non-significance (MDNS) and have the following comments:

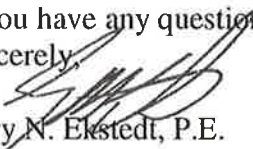
1. The MDNS should address all impacts to the natural and built environments, including construction of onsite and offsite improvements required for the project. This includes, but is not limited to, impacts to the floodplain/floodway from road improvements, traffic impacts on nearby local access roads, etc.
2. Under the Findings #7 of the MDNS it states that, "all proposed road and utilities for development of Phase 1 are located outside of the 100-year floodplain, and any critical areas," however what about additional phases?
3. Page 3 of the MDNS states that Yakima County has jurisdiction over the three intersections on Ahtanum Rd. within the study area. Yakima County has jurisdiction over the intersections at S. 38th and S.52nd but not the intersection of S.16th.
4. The Traffic Impact Analysis (TIA) has several required revisions:
 - a. The TIA states that the site is located in a "predominately rural area". The site is actually located within the City of Yakima and is not in a rural area or setting. As such the proposed project should provide provisions for other modes of transportation including walkers/joggers and bicycles. There is no analysis of alternative modes of travel in the document.
 - b. The TIA refers to two access points into the site, however the site plans shows three access points. The trips distribution should be re-evaluated based on the three access points.
 - c. The study did not address the intersections that are immediately adjacent to the site. S. 38th @ Sorensen and Sorensen @ S.36th for operation and delay due to the proposed alignment revisions and additional traffic volumes.

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- d. The TIA did not address additional delays and impacts to Springcreek Rd. @ S.40th, Springcreek Rd. @ S.41st, Springcreek Rd @ S. 44th, Springcreek Rd @ S. 45th, Springcreek Rd @ S. 47th, S. 38th @ W. Larch Ave and S. 38th @ Oak Ave. for impacts and delays to the existing residences.
 - e. The TIA did not provide any roadway capacity analysis, only intersection capacity was provided. The existing configuration of S. 36th, S.38th and Sorensen may not be able to handle the additional trips without improvements.
 - f. S. 38th @ Ahtanum was identified in the TIA as requiring signalization. Yakima County does not believe that signalization of this intersection provides any benefit to the overall transportation system. It will add additional delay to traffic using Ahtanum Road in favor of the traffic accessing the new sports complex. Yakima County requested that the site be accessed by an extension of Occidental Road from S. 52nd to S.38th. This connection was not addressed in the TIA. The signalization of S.38th @ Ahtanum Road may be considered if the signal is temporary (installed on spanwire) and with the understanding that when the extension of Occidental is completed that the signal hardware will be relocated to the intersection of S.52nd and Ahtanum. The required widening of Ahtanum Road to accommodate the left turn lane at S.38th will be required to be designed and constructed to Yakima County standards by the project proponents.
5. Section B, Transportation will be required to be modified to reflect the revision to the TIA.
 6. The phasing of the project will need to be revisited based the fact that the TIA assumed that there were no roadway capacity issues on the roadways adjacent to the site. However, it is evident that S.36th and Sorensen cannot accommodate that increased traffic and that improvements will be required. Because of the required construction on these roadways the only access will be via S.36th. This will require revisions to the phasing plan and the timing of the proposed improvements.
 7. The conclusions will need to be modified to address the above revisions.

If you have any questions please let us know.

Sincerely,


Gary N. Ekstedt, P.E.
County Engineer


Lynn Deitrick, AICP
Planning Official

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Yakima County ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, nation origin, or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Yakima County's Title VI Program, you may contact the Title VI Coordinator at 509-574-2300.

If this letter pertains to a meeting and you need special accommodations, please call us at 509-574-2300 by 10:00 a.m. three days prior to the meeting. For TDD users, please use the State's toll free relay service 1-800-833-6388 and ask the operator to dial 509-574-2300.



February 23, 2016

Public Services

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VERN M. REDIFER, P.E. - Director

Mr. Matt Hughart, AICP
Kittelson & Associates, Inc.
610 SW Alder Street
Suite 700
Portland, Oregon 97205

Dear Mr. Hughart:

**SUBJECT: SOZO Sports of Central Washington
Transportation Impact Analysis – Supplemental Analysis**

We have reviewed your supplemental analysis for the above project and have the following comments:

1. The supplemental analysis talks about the operation of eight soccer fields by spring of 2016. Neither the report nor the associated maps clearly identifies the eight field that will be operated in phase 1 of construction. Please clarify the location of the eight soccer fields that will be open and in operation in the spring of 2016.
2. Delay to roadways intersecting Spring Creek Road. Yakima County had requested additional analysis to determine the impacts to the residences accessing Spring Creek Road from S. 40th Avenue, S. 41st Avenue, S. 44 Avenue, S. 45th Avenue and S 47th Avenue. You provided Level-of-Service analysis for these intersections, but what was requested was the amount (or percent) of increased delay at these intersections. Please provide the amount of increased delay at these intersections.
3. The intersection of S. 38th Avenue and Sorenson Road has been analyzed as a yield condition. Yakima County will not operate this intersection as a yield. The yield does not adequately assign the right-of-way to all movements in the intersection. This intersection will need to be re-analyzed with stop control.
4. The intersection of S. 36th Avenue and Sorenson Road has been analyzed as a continuous movement. Yakima County has previously indicated that the geometry is not adequate for this to operate in this configuration. The recommendation was made to make this a "T" intersection to accommodate the lack of curve radius. Either this intersection will need to be re-analyzed as a "T" intersection or additional right-of-way will need to be dedicated in order to construct curves that meet AASHTO standards for a 25 MPH design speed.

Yakima County ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin, or sex in the provision of benefits and services resulting from its federally assisted programs and activities. For questions regarding Yakima County's Title VI Program, you may contact the Title VI Coordinator at 509-574-2300.

If this letter pertains to a meeting and you need special accommodations, please call us at 509-574-2300 by 10:00 a.m. three days prior to the meeting. For TDD users, please use the State's toll free relay service 1-800-833-6388 and ask the operator to dial 509-574-2300.

5. It appears that the intersection of Ahtanum and S. 38th Avenue will require signalization for the operation of the eight fields during the construction of S. 36th Avenue. Given the fact that The City of Yakima is scheduled to go to construction of S. 36th Avenue in 2016 and that signal plans have been prepared or approved. Please identify how many fields can be in operation with no traffic signal and S. 36th Avenue under construction.

Please let me know if you have any questions or require any clarification.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kent L. McHenry".

Kent L. McHenry, P.E.

Transportation Engineering Manager

Peters, Jeff

From: Matt Hughart <MHUGHART@kittelsohn.com>
Sent: Wednesday, March 02, 2016 7:01 AM
To: Davenport, Joan; Sheffield, Brett; Peters, Jeff; Leanne Liddicoat
Subject: Fwd: Updated Yakima Tables

Joan,

Here are a revised set of Tables 2 and 3 from our response memo that addresses the change in delay along the Spring Creek Road intersections. Please review and forward to Kent if you have no further questions. Per our discussion on Monday, we will not prepare responses to the other questions in Kent's e-mail. Please let me know if you need anything else.

Matt Hughart, AICP
Kittelsohn & Associates, Inc.
503-228-5230

Begin forwarded message:

From: Zachary Bugg <zbugg@kittelsohn.com>
Date: March 2, 2016 at 6:51:24 AM PST
To: Matt Hughart <MHUGHART@kittelsohn.com>
Subject: Updated Yakima Tables

Table 2 - Spring Creek Road Delay Analysis – Partial 8-Field Build-out

		Spring Creek / 40th		Spring Creek / 41st		Spring Creek / 44th		Spring Creek / 45th		Spring Creek / 47th	
Number of Houses Served		6		16		25		4		23	
Existing Conditions											
Time Period		PM	SAT	PM	SAT	PM	SAT	PM	SAT	PM	SAT
Northbound Approach LOS		A	A	A	A	A	A	A	A	A	A
Northbound Approach Delay (sec)		8.8	8.7	8.9	8.7	8.9	8.7	9.1	8.6	8.9	8.6
Partial 8-Field Build-out											
Trip Generation	In	4	3	10	8	16	13	3	2	14	12
	Out	2	3	6	7	9	11	1	2	9	10
Northbound LOS		A	A	A	A	A	A	A	A	A	A
Northbound Approach Delay (sec)		9.3	9.3	9.5	9.2	9.4	9.3	9.8	9.1	9.5	9.2

Table 3 - Spring Creek Road Delay Analysis – Full Site Build-out

	Spring Creek / 40th		Spring Creek / 41st		Spring Creek / 44th		Spring Creek / 45th		Spring Creek / 47th	
Number of Houses Served	6		16		25		4		23	
Existing Conditions										
Time Period	PM	SAT	PM	SAT	PM	SAT	PM	SAT	PM	SAT
Northbound Approach LOS	A	A	A	A	A	A	A	A	A	A
Northbound Approach Delay (sec)	8.8	8.7	8.9	8.7	8.9	8.7	9.1	8.6	8.9	8.6

Full Site Build-out											
Trip Generation	In	4	3	10	8	16	13	3	2	14	12
	Out	2	3	6	7	9	11	1	2	9	10
Northbound LOS		A	A	A	A	A	A	A	A	A	A
Northbound Approach Delay (sec)		9.4	9.6	9.5	9.6	9.5	9.6	9.8	9.4	9.5	9.5

Zachary Bugg, PhD, EI
Engineering Associate

Kittelson & Associates, Inc.
Transportation Engineering / Planning
36 South Charles Street, Suite 1920
Baltimore, Maryland 21201
410.347.9610
443.524.9413 (direct)

[Streetwise](#) [Twitter](#) [Facebook](#)

<image001.jpg>

Peters, Jeff

From: Davenport, Joan
Sent: Thursday, February 25, 2016 4:28 PM
To: Matt Hughart; Kent McHenry (kent.mchenry@co.yakima.wa.us); Sheffield, Brett; Peters, Jeff
Cc: Leanne Liddicoat
Subject: City of Yakima response to Yakima County traffic comments

These remarks are in response to the letter from Kent McHenry, dated February 23, 2016 related to comments from the Kittelson Associates Supplemental Traffic Analysis for the SOZO Sports Complex. I do not see that any of Kent's questions would require additional analysis by Matt – I am providing my responses. Matt and others, please feel free to weigh in. Jeff Peters and I are waiting to hear from the group to see if we are "good to go" on the analysis.

1. Supplemental Traffic Analysis does not identify location of up to 8 fields in Phase 1: *An updated site plan will be provided.*
2. Delay to side streets & intersections with Spring Creek Road – *Table 2 of the supplemental report lists by intersection the number of added trips to each of the side streets (40th Ave, 41st Ave, 44th Ave, 45th Ave and 47th Ave). The report concludes that all streets will continue to operate at Level of Service "A". Appendix A included the detail work sheets.*
3. Concern about YIELD control at 38th Ave & Ahtanum Rd. *The proposed SEPA MDNS includes the requirement for construction of a "T" intersection design at 38th Ave and Sorenson Road. Installation of STOP control is appropriate. No additional analysis is requested from Kittelson Associates. Yakima County Public Works will dictate the appropriate design, and right of way for street construction, which the City will install with the support of SIED funds.*
4. The intersection of 36th Avenue and Sorenson Road *will be constructed to Yakima County specifications. No additional traffic analysis is requested from Kittelson Associates.*
5. How many fields can be played without a traffic signal at 38th Ave & Ahtanum? *The Traffic Analysis states "Based on an iterations analysis, it was concluded that signalization and associated widening of Ahtanum would be needed at the equivalent of 12 or more soccer fields.*

Joan Davenport, AICP
Director of Community Development
City of Yakima
129 North 2nd St
Yakima, WA 98901
Joan.davenport@yakimawa.gov
(509)576-6417